Project Introduction

We propose a cognitively inspired architecture for deploying an automated intelligent onboard operator assistant. This assistant facilitates the onboard control while finding a compromise between increasing the operator's awareness of the system tasks and decreasing the operator's workload. The core of this assistant is an adaptive algorithm (AA) that determines the appropriate level of automation (LOA) for the current mission phase depending on factors such as the operator's workload and situation awareness, mission phase requirements and state, as well as human-automation interactions and supervisory control issues. The goal of our proposed agent-based architecture is to facilitate the creation and evaluation of AA algorithms. In order to easily define AA strategies, the architecture provides facilities to explicitly represent, reason with, and update the state of the different knowledge structures needed by the AA. We will develop a testbed to evaluate different AAs regarding the operator's situation awareness in a multi-agent dynamic scenario. To promote experimenter control and rapid evaluations, a graphical behavior language will be used to define the behavior of entities in a simulator-based experimental scenario. Phase I will focus on the definition of the testbed and in creating a system prototype. Phase II will focus on making the architecture robust and testing it in a high fidelity simulator.

Primary U.S. Work Locations and Key Partners

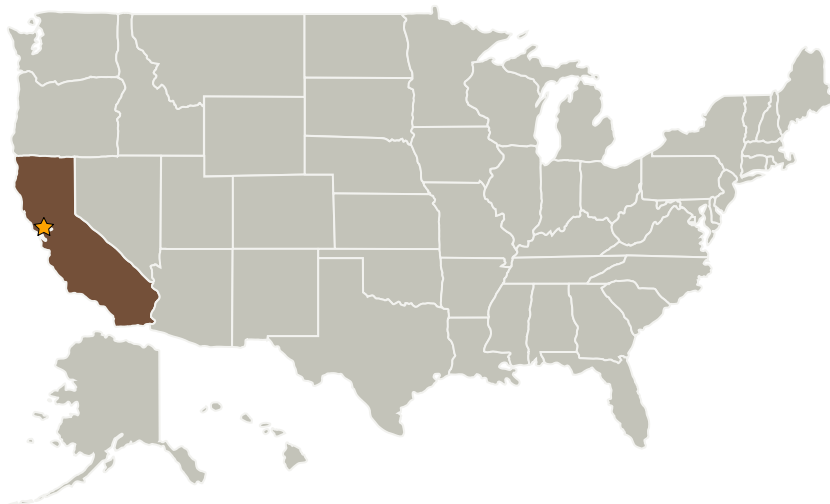

The Cognitive Onboard Operator Assistant Architecture, Phase I

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
⭐Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Stottler Henke Associates, Inc.	Supporting Organization	Industry	San Mateo, California

Primary U.S. Work Locations
California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Emilio Remolina

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  └ TX07.3 Mission Operations and Safety
    └ TX07.3.3 Training

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